Science Together

KNAUER

Installation Guide PurityChrom® MCC

1. PurityChrom MCC operates under Microsoft Windows XP, Windows Vista, Windows 7, Windows 8, and Windows 10.
   The supported languages are: German and English

2. Automatic switching to energy-saving mode or hibernating has to be disabled i.e. settings for "Turn Off Hardware", "Turn off Computer" or "System Standby" must be set to "Never" in the control panels energy options. Microsoft Security Essentials is installed, please exclude PurityChrom MCC . Therefore, open Microsoft Security Essentials and go to Setup. In "Excluded files and locations" you have to search for C:\PurityChrom-MCC- and add this folder to excluded files. In "Excluded processes" you have to search for C:\PurityChrom\PurityChrom-MCC-.exe and add this process to the excluded processes. Furthermore, the Windows Defender has to be deactivated. Therefore, got to "Extras" and/or "Settings". Choose "Administrator" and uncheck "Turn on this program" or Turn on this app".

3. The user account settings have to be set to "Never notify" before installation. After the installation, the settings can be reset. (Start → Control Panel → User Accounts → User Accounts → Change User Account Control Settings → Never notify)

4. Inactivate the option "Beta: Unicode UTF-8" under the region settings of the computer (Windows settings → Time & Language → Region → additional date, time and regional settings → Region → Administrative → change system localization → inactivate "Beta: Use Unicode UTF-8 for worldwide language support).

5. Set PC to fixed IP Address if it is not connected to a router or a router is connected via a second network card.

6. Insert the CD which includes PurityChrom MCC .

7. Start the installation as an administrator. The installer will ask you to choose the language of the software, your integrated UV-detector, and the destination location for the files that will be installed. Do not change the given destination. If not otherwise specified use **English** as the software language.

8. Restart your computer.

9. Installation under Windows versions <u>older</u> than 8 or 10: Go to C:\PurityChrom-MCC- and right-click the PurityChrom-MCC-.exe to open the properties. Go to compatibility and check "Run this program in compatibility mode for" and choose "Windows Vista (Service Pack 2). After this, check "Run this program as an administrator". Click "Apply" and "Ok", then close the window.

10. **Installation under Windows 8 or 10:** Run Installation-Setup as administrator, then open the PurityChrom MCC program folder „C:\PurityChrom-MCC\", use a right-click on „PurityChrom-MCC.exe" and select once „Run as administrator",

    Open the „Communication Log"-Window and the "System Visualisation" once. Then close the software.

11. Connect your devices. All devices that should be connected by LAN should be set to LAN and need fixed IP addresses.

AZURA L/ VU 4.1	Mobile Control/Service Tool/Firmware Wizard (in folder "Tools" on PurityChrom MCC CD)
UVD 2.1S	Firmware Wizard (in folder "Tools" on PurityChrom MCC CD)
Conductivity Monitor CM 2.1S	FW Wizard via Mac Address

12. If UV detectors of different types should be used in one system, a separate driver is required. Copy the driver from *C:\PurityChrom\DriverDll* and rename the file:

    UVD21SAddCh.dll → PrepConAddCh.dll

    and paste them to C:\Windows\SysWOW64 (64-bit system) or C:\Windows\System32 (32-bit system).

13. In the next step, you have to change the "PurityChrom.ini"-file according to the connected devices. This file is located in C:\Windows\

WinsockPorts
- In [WinsockPorts] the IP addresses and Ports of LAN-connected devices are entered if they do not have a separate entry.

    For example: Port1=192.168.5.1,10001

- Freestanding devices have the IP-Port number 10001,
- IP-Port for Fraction Collector Foxy R1/R2 is 23,
- Devices that are connected via serial interface are not filled in.

- The **ASM2.2L** basic module has the IP port 10001, the left module 10002, the middle module 10004, and the right module 10006
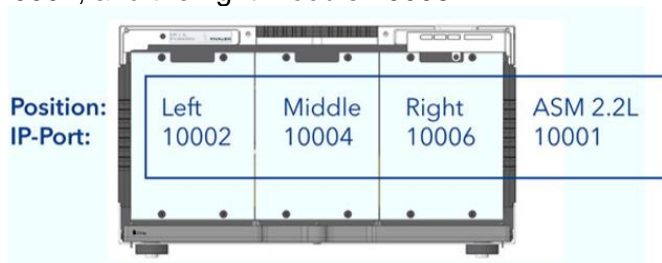
Pumps

There is a separate entry for pumps parameter under [Pumps].
- ➔ Set "SoftwareHPG=0" (for isocratic)
- ➔ OnlyIsocratic=1

Pumps do not stop at the command "Stop all"
- You can decide whether pumps should stop or pump further when pressing "Stop all".

    [Pumps]
    PumpStopRequest=1

UV-Detector
- There is a separate entry for the connected detector in the PurityChrom.ini-file:

[KnauerUVD]		
Enabled=0	[0/1]	OFF = 0, ON = 1 (using a detector connected via serial interface or via LAN the value has to be set to 1; using a detector connected via an A/D converter the value has to be set to 0)
IP=	[IP]	IP-address
Port=	[Port]	port number
IP2=	[IP]	IP-address for detector 2*
Port2=	[Port]	port number for detector 2*
IP3=	[IP]	IP-address for detector 3*
Port3=	[Port]	port number for detector 3*
IP4=	[IP]	IP-address for detector 4*
Port4=	[Port]	port number for detector 4*
NDetectors=	[Value]	number of detectors
BaudRate=9600	[Value]	baud rate
Wavelength1=254	[Value]	pre-set wavelength
DataRate=50	[Value]	The data rate of the detector (don`t change the data rate as the detector will send the maximum data rate); Default =50
Channels=1	[Value]	Number of channels; UVD = 1;
Integration=100	[0 – 2000]	set the integration time of the detector to 100 ms
Type=UVD2.1S	[Type]	Your detector type (UVD2.1S, UVD2.1L)
MCC=0	[0/1]	enabled/disabled special MCC features/configuration

- If the UV-detector is connected via serial interface hide the IP address by using an inverted comma ('IP=) and enter the number of the COMPort under Port.

* only add if more than one UVD2.1S/UVD2.1L are used in a system. These entries are only possible if all detectors are the same type. To connect an additional UV detector of another type, use the following ini entries:

[AddChKnauerUVD]		
Enabled=0	[0/1]	OFF = 0, ON = 1 (using a detector connected via serial interface or via LAN the value has to be set to 1; using a detector connected via an A/D converter the value has to be set to 0)
IP=	[IP]	IP-address

Port=	[Port]	port number
IP2=	[IP]	IP-address for detector 2*
Port2=	[Port]	port number for detector 2*
IP3=	[IP]	IP-address for detector 3*
Port3=	[Port]	port number for detector 3*
IP4=	[IP]	IP-address for detector 4*
Port4=	[Port]	port number for detector 4*
NDetectors=	[Value]	number of detectors
BaudRate=9600	[Value]	baud rate
Wavelength1=254	[Value]	pre-set wavelength
DataRate=50	[Value]	The data rate of the detector (don`t change the data rate as the detector will send the maximum data rate); Default =50
Channels=4	[Value]	Number of channels; UVD = 1;
Integration=100	[0 – 2000]	set the integration time of the detector to 100 ms
Type= MWD2.1L	[Type]	Your detector type (UVD2.1S, UVD2.1L, 50D)
MCC=0	[0/1]	enabled/disabled special MCC features/configuration

* only add if more than one UVD2.1S/UVD2.1L are used in a system. These entries are only possible if all detectors are the same type.

RI Detector
- There is a separate entry for the connected RID 2.1L in the PurityChrom.ini-file:

[KnauerRID21L]

Enabled=	[0/1]	OFF = 0, ON = 1
IP=	[IP]	IP-address
Port=	[Port]	Port number (KNAUER: 10001)
DataRate=	[Value]	Datarate of the detector
Channels=1	[Value]	Number of channels
TimeConst=2000	[Value]	Time constant
SignalMode=0	[Value]	Signal mode, 0=direct, 1=inverted
AnswerTimeOut=1	[Value]	Do no change
ConnectionTimeOut=1	[Value]	Do not change
Temperature=0 / 30-55	[Value]	0 = off, 30-55 = Temperature is set after start
TempZone=1	[1-8]	1= [Temperature] FunctionName1=… 2= [Temperature] FunctionName2=… …

Conductivity Monitor
- There is a separate entry for the connected conductivity monitor in the PurityChrom.ini-file:

[KnauerCM21S]

Enabled=0	[0/1]	OFF = 0, ON = 1 (using a detector connected via serial interface or via LAN the value has to be set to 1; using a detector connected via an A/D converter the value has to be set to 0)
IP=	[IP]	IP-address for conductivity monitor 1

Port=	[Port]	Port number for conductivity monitor 1
IP2=	[IP]	IP-address for conductivity monitor 2*
Port2=	[Port]	Port number for conductivity monitor 2*
IP3=	[IP]	IP-address for conductivity monitor 3*
Port3=	[Port]	Port number for conductivity monitor 3*
IP4=	[IP]	IP-address for conductivity monitor 4*
Port4=	[Port]	Port number for conductivity monitor 4*
DataRate=1	[Value]	Data rate of the monitor
ChannelMap=1,2,4,5,7,8,10,11	[Value]	Select here the channels of conductivity monitor you want to monitor
Channels=8	[Value]	Number of channels (1 = conductivity, 2 = conductivity and pH 3 = conductivity, pH and Cell-Temperature)

- If the conductivity monitor is connected via serial interface hide the IP address by using an inverted comma ('IP=) and enter the number of the COMPort under Port.

* only add if more than one CM2.1S are used in a system.

Leaksensors/Errormessages
- There are separate entries for the **ASM** and its Leakage sensor / Error messages in the PurityChrom.ini-file:

  [LeakageKnauerASM]
Enabled=	[0/1]	OFF = 0, ON = 1
IP=	[IP]	IP-address
Port=	[Port]	IP Port

- Only one ASM can be checked for leakage/error, please fill in the IP address of the lowest ASM in the tower and connect Error Out of the ones not checked by the software with the one that is, if necessary.

- For the Leakage sensor of the **pumps** define [LeakageInput] with the recommended setting: LeakageCountdown=0

  [LeakageInput]
  LeakageInput1=3 (for major Pump)
  LeakageInput2=7 (for Minor Pump (**not P2.1S/P4.1S**))
  LeakageInput3=0
  LeakageInput4=0
  LeakageCountdown=0
  Soundfile=SysAlert.wav
  WindowsShutdown=0
  Message1=Leakage detected Major Pump
  Message2= Leakage detected Minor Pump
  Message3=
  Message4=

Memmert Oven
- There is a separate entry for the Memmert Oven in the PurityChrom.ini-file:

```
[Memmert]
Enabled=              [ 0/1 ]     OFF = 0, ON = 1
IP=                   [ IP ]      IP-address
T=                    [ Value ]   Default Temperature
Tmax=                 [ Value ]   Max. Temperature
```

Direct Control
- To use the direct control function during the run to change the flowrate and the gradient composition change the Puritychrom.ini file as described here:

```
[Pumps]
Parameterchange=1
```

SMB Data files (only for usage with Azura SMB Systems)

There is a separate entry to determine the maximum cycles written in one data file.
For Example: MaxCycleCounter= 10 → After each 10 cycles a data file is written.

Note: A data file will be written, if one condition (MaxCycleCounter, MaxElapsedValue, or MaxTTLines) is fulfilled.
The entry Active=1 activates and =0 deactivates the SMB functions.

```
[SMB]
Active=1
MaxCycleCounter=10
MaxElapsedValue=1440
MaxTTLines=500
```

Tailing Factor instead of Asymmetry
- If the tailing factor should be calculated instead of the asymmetry, please change the PurityChrom.ini-file as described here:

```
[IntegrationPresets]
TailingFactor=1
```

Deactivate automatic Integration
- Please change the PurityChrom.ini-file as described here to deactivate the integration.

```
[IntegrationPresets]
IntegrateInhibit=1,2,3…. (your data channels)
```

Demo chromatogram
- Starting Puritychrom MCC in the demo version, there is a possibility to run a demo method

Choose the result file here:

[DemoMode]
Chromatogram=C: \PurityChrom-MCC-\Data\ResultFileExample_0001.rfp

Bronkhorst Flowmeter
- There is a separate entry for the flowmeter in the PurityChrom.ini-file:

[BronkFlow]

Enabled=	[0/1]	OFF = 0, ON = 1
Port=	[Port]	Com Port
Port2=	[Value]	Com Port
Port3=	[Value]	Com Port
Port4=	[Value]	Com Port
Port5=	[Value]	Com Port
Port6=	[Value]	Com Port
Port7=	[Value]	Com Port
Port8=	[Value]	Com Port
SearchNodes=0	[0/1]	OFF = 0, ON = 1
SearchRange=1,8	[Value]	Range of nodes in which the software should search for active flowmeters
Node1=	[Value]	If the functions "SearchNode" and
Node2=	[Value]	"SearchRange" are not used, add here
Node3=	[Value]	the node addresses of each flowmeter
Node4=	[Value]	
Node5=	[Value]	
Node6=	[Value]	
Node7=	[Value]	
Node8=	[Value]	
Channels=	[Value]	numbers of channels in total
Message=	[0/1]	OFF = 0, ON = 1 If activated, a message box with information about found flowmeters and their respective capacities will appear after software start
Logfile=	[0/1]	OFF = 0, ON = 1 If activated, the communication between software and flowmeters will be logged in a separated file saved in the program folder C:/PurityChrom-MCC-/
UseBus=	[0/1]	OFF = 0, ON = 1 for using the BUS system for communication of flowmeters with the software choose 1, for using individual RS-232 cables for each flowmeter choose 0

14. Start the software. If the connection has been successful green ticks will appear behind the port number and if the connection was not successful a red cross will appear behind the port number.

15. Configuration of PurityChrom MCC

- The menu option SETUP ⚒ in the main window will open the program settings window:

[Communication]
Please choose the correct Ports, baud rates, and drivers for your devices according to the PurityChrom MCC manual.

Note: Do not change the number of addresses in the Addr. Row!

For Azura Lab SMB:

Device	Address	Positions	Port	Type/Driver
Zone 1 Pump	1	3	WinsockPort	P4.1 S
Zone 2 Pump	2	6	WinsockPort	P4.1 S
Feed Pump	3	11	WinsockPort	P4.1 S
Zone 4 Pump	4	9	WinsockPort	P4.1 S

For Azura Pilot SMB:

Device	Address	Positions	Port	Type/Driver
Zone 1 Pump	1	8	WinsockPort	P2.1 L
Zone 2 Pump	2	9	WinsockPort	P2.1 L
Feed Pump	3	10	WinsockPort	P2.1 L
Zone 4 Pump	4	11	WinsockPort	P2.1 L

[Presets]

Choose the right maximum pressure and maximum flow rate for the pump system.

AZURA Lab SMB:

Zone 1, Zone 2, Feed, Zone 4 → Max. Pressure = 200 bar
Zone 1, Zone 2, Zone 4 → Max. Flowrate = 50 ml/min
Feed → Max. Flowrate = 10 ml/min

AZURA Pilot SMB:

Zone 1, Zone 2, Feed, Zone 4 → Max. Pressure = 100 bar
Zone 1, Zone 2, Zone 4 → Max. Flowrate = 500 ml/min
Feed → Max. Flowrate = 100 ml/min
Zone 1, Zone 2, Feed, Zone 4 → Serial Cycle= 1000ms

Configuration of RID 2.1L

The flush valve needs to be configured separately:
Addr.: 1, Pos.: 2, Port: Driver 3, Type: Standard Valve

Data output is in nRIU. For µRIU please change the factor in the channel setting to 0,001.

- Using trigger signals, you can choose under "Control Inputs" to stop all, to start a run (Time Control Start), or to pause a run (Time Control Hold/Continue) depending on the signal. Using an air sensor connected via gameport adapter you must choose "Gameport Input 1, 2, 3 or 4". Using an air sensor connected via ethernet event box you must choose the respective Event Box Input number.

Valves:
The valves must be configured additionally.

Device	Address	Positions	Port	Type
Knauer VU4.1	1	11	WinsockPort	Knauer VU4.1 Valve

[Presets]
Choose the right maximum pressure for all pumps in the system.
Choose the right maximum flow rate for all pumps in the system.

[Limiter]
The fraction limiter is a feature that calculates the volume after which the collector will step to the next position dependent on the flow rate. In the limiter setup, the fraction limiter can be configured.

[Annotation]
The automatic annotations in the chromatograms are configured in the annotation Setup**.**

[Dead Time / Volume]
A considerable dead volume can occur in the tubing and valves between the detector cell and the waste/fraction switching valve, which results in a time delay when fractionating, especially at low flow rates. In the Dead Time / Dead Volume setup, you can define the dead volume or dead time of your system

[Description]
You can define the names of the event box inputs and outputs, valves, and the auxiliary output of the pump interface in the description's setup. This makes it easier to program time control files. It also makes the visualizations clearer, since the inputs, outputs, and valves can be listed by function.

Injection Valve:	Position 1:	Load
	Position 2:	Inject
Multiposition Valve for Fractionation:	Position 1:	Waste

Column Selection Valve

Position 2:   Fraction 1…
Position1-11: Bypass
                Column 1-5
                 Rev Column 1-5

Multi-Injection Valve

Position 1:   Manual load
Position 2:   Inject
Position 3:   Direct Inject
Position 4:   Pump Load

Configuration of fraction valves OR Valves of the fraction collector

[Limiter]
a) Limiter activation
Activate **Controlled Valve**, select the fraction valve or the valve of the fraction collector and choose "**Not waste**"
The fractionation should start if the fraction valve or the valve of your fraction collector changes the position from "Waste" to "Not waste" and the pumps are running. Therefore, choose your fraction collector valve in "Controlled Valve".

b) Limiter Output
Choose **Controlled Collector (Next Vial)** for a fraction collector.
Choose **Controlled Valve (Next Position)** for a fractionation valve.

[Annotation]
c) Waste Annotation Device
Choose the fraction valve <u>or</u> the valve of the fraction collector and **Waste.**

d) Fraction Annotation Device
Choose the fraction valve <u>or</u> the valve of the fraction collector and **Not Waste.**

e) Step Annotation Device
Choose **Controlled Collector Step** for fraction collector.
Choose **Controlled Valve Position Change** for fractionation valve.

[Dead Time / Volume]
f) Controlled Collector AND Controlled Valves
Here, enter the delay volume (volume from detector cell to fraction collector)

Note: if no fraction valve or fraction collector is used, please deactivate Controlled Valve in the Limiter activation section

Configuration of toolbar buttons
If toolbar buttons are missing, double-clicking on an empty space next to the toolbar buttons will open a selection window. Tick all boxes needed for the configuration at hand.

Configuration of Function Tab in Time Table Editor
To deactivate unnecessary functions, press shift and untick the functions, which should not be available.

Configuration of used data channels
Order of data channels:
1. MWD/UVD
2. CM (+pH)
3. Additional UVD

The menu option „Chromatogram" in the main window opens the „Analysis window".

Using the icon „tools" the selected channel can be configured (for example the name and the dimension). Read the manual for more information.
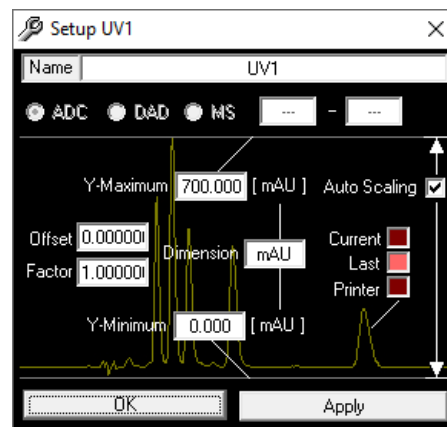
Device	Channel Name	Modus	Dimension	Factor
UWD/MWD	UV1/ UV2*/ UV3*/ UV4*	ADC	mAU	1
CM	Conductivity Monitor	ADC	mS/cm	1
pH	pH	ADC	-	1

*depending on Channel number of device (as set in .ini file)

16. If the installation and configuration are finished, close the software. Copy the license file (PurtiyChrom.lic) on the CD (in the folder: *License*) to C:\PurityChrom-MCC- and insert the USB license dongle into a free USB port of the computer. The license will be recognized and can be used. Do not remove the dongle while PurityChrom MCC is running.

17. KNAUER is not responsible for lost dongles. Losing the dongle means losing the license.

18. Restart your computer and the software PurityChrom MCC once a week.

Attachment: IP addresses for non-SMB Usage

- the following IP addresses are recommended for non-SMB Usage:

  (subnet mask: 255.255.255.0, gateway: 192.168.1.1)

Device	IP-Address
Computer	192.168.1.100
Pump 1	192.168.1.101
Pump 2	192.168.1.102
Pump 3	192.168.1.103
Pump 4	192.168.1.104
Pump 5	192.168.1.105
Pump 6	192.168.1.106
Pump 7	192.168.1.107
Pump 8	192.168.1.108
Detector	192.168.1.110
CM2.1S	192.168.1.111
Valve 1 (not in ASM)	192.168.1.115
Valve 2 (not in ASM)	192.168.1.116
Valve 3 (not in ASM)	192.168.1.117
Valve 4 (not in ASM)	192.168.1.118
Valve 5 (not in ASM)	192.168.1.119

Mark devices with stickers: „Fixed IP-Address: 192.168.1.XXX"

Attachment: IP addresses for AZURA SMB

- the following IP addresses are recommended for non-SMB Usage:

  (subnet mask: 255.255.255.0, gateway: 192.168.1.1)

Device	IP-Address	Tool for fixed IP
Computer	192.168.1.100	
Zone 1 Pump (P 2.1L)	192.168.1.101	SN in FW
Zone 2 Pump (P 2.1L)	192.168.1.102	SN in FW
Feed Pump (P 2.1L)	192.168.1.103	SN in FW
Zone 4 Pump (P 2.1L)	192.168.1.104	SN in FW
Assistant 1 (In the tower from bottom to top)	192.168.1.105	SN in FW
Assistant 2 (In the tower from bottom to top)	192.168.1.106	SN in FW
Assistant 3 (In the tower from bottom to top)	192.168.1.107	SN in FW
Assistant 4 (In the tower from bottom to top)	192.168.1.108	SN in FW
Detector 1	192.168.1.110	SN in FW
Detector 2	192.168.1.111	SN in FW
Memmert Oven	192.168.1.121	FW via MAC Adresse/via Oven Display